



DEPARTMENT OF THE AIR FORCE
59TH MEDICAL WING (AETC)
JOINT BASE SAN ANTONIO - LACKLAND TEXAS

6 MAY 2016

MEMORANDUM FOR ST

ATTN: KEVIN WU

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled **Ex-Vivo Graft Preservation with Hydrogen Sulfide and Hydrogen Iodide for Suspended Animation of Non-Human Primate (Macaca Mulatta) Upper Extremity Vascularized Composite Allotransplants** presented at/published to **Association of Surgeons Great Britain and Ireland 11-13 May 2016** with MDWI 41-108, and has been assigned local file #16192.
2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.
3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are 59 MDW staff member, we can forward your request for funds to the designated wing POC.
4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC
Director, Clinical Investigations & Research Support

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

INSTRUCTIONS

USE ONLY THE MOST CURRENT 59 MDW FORM 3039 LOCATED ON AF E-PUBLISHING

1. The author must complete page two of this form:
 - a. In Section 2, add the funding source for your study [e.g., 59 MDW CRD Graduate Health Sciences Education (GHSE) (SG5 O&M); SG5 R&D; Tri-Service Nursing Research Program (TSNRP); Defense Medical Research & Development Program (DMRDP); NIH; Congressionally Directed Medical Research Program (CDMRP) ; Grants; etc.]
 - b. In Section 2, there may be funding available for journal costs, if your department is not paying for figures, tables or photographs for your publication. Please state "YES" or "NO" in Section 2 of the form, if you need publication funding support.
2. Print your name, rank/grade, sign and date the form in the author's signature block or use an electronic signature.
3. Attach a copy of the 59 MDW IRB or IACUC approval letter for the research related study. If this is a technical publication/presentation, state the type (e.g. case report, QA/QI study, program evaluation study, informational report/briefing, etc.) in the "Protocol Title" box.
4. Attach a copy of your abstract, paper, poster and other supporting documentation.
5. Save and forward, via email, the processing form and all supporting documentation to your unit commander, program director or immediate supervisor for review/approval.
6. On page 2, have either your unit commander, program director or immediate supervisor:
 - a. Print their name, rank/grade, title; sign and date the form in the approving authority's signature block or use an electronic signature.
7. Submit your completed form and all supporting documentation to the CRD for processing (59crdpubspres@us.af.mil). If you have any questions or concerns, please contact the 59 CRD/ Publications and Presentations Section at 292-7141 for assistance.
8. The 59 CRD/Publications and Presentations Section will route the request form to clinical investigations, 502 ISG/JAC (Ethics Review) and Public Affairs (59 MDW/PA) for review and then forward you a final letter of approval or disapproval.
9. Once your manuscript, poster or presentation has been approved for a one-time public release, you may proceed with your publication or presentation submission activities, as stated on this form. **Note:** For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.
10. If your manuscript is accepted for scientific publication, please contact the 59 CRD/Publications and Presentations Section at 292-7141. This information is reported to the 59 MDW/CC. All medical research or technical information publications/presentations must be reported to the Defense Technical Information Center (DITC). See 59 MDWI 41-108, *Presentation and Publication of Medical and Technical Papers*, for additional information.

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement:
"The views expressed are those of the [author(s)] [presenter(s)] and do not reflect the official views or policy of the Department of Defense or its Components"

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving humans:
"The voluntary, fully informed consent of the subjects used in this research was obtained as required by 32 CFR 219 and DODI 3216.02_AFI 40-402."

NOTE: All abstracts, papers, posters, etc., should contain the following disclaimer statement for research involving animals, as required by AFMAN 40-401_IP :
"The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended."

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

1. TO: CLINICAL RESEARCH 2. FROM: (Author's Name, Rank, Grade, Office Symbol)
Kevin Wu, CTR 3. GME/GHSE STUDENT: ☒ YES ☐ NO 4. PROTOCOL NUMBER:
NAVY15-05

5. PROTOCOL TITLE: (NOTE: For each new release of medical research or technical information as a publication/presentation, a new 59 MDW Form 3039 must be submitted for review and approval.)

Ex-vivo Graft Preservation with Hydrogen Sulfide and Hydrogen Selenide for Suspended Animation of Non-Human Primate (Macaca mulatta)

6. TITLE OF MATERIAL TO BE PUBLISHED OR PRESENTED:

Ex-vivo Graft Preservation with Hydrogen Sulfide and Hydrogen Iodide for Suspended Animation of Non-Human Primate (Macaca mulatta)

7. FUNDING RECEIVED FOR THIS STUDY? ☒ YES ☐ NO FUNDING SOURCE: JPC8

8. DO YOU NEED FUNDING SUPPORT FOR PUBLICATION PURPOSES: ☐ YES ☒ NO

9. IS THIS MATERIAL CLASSIFIED? ☐ YES ☒ NO

10. IS THIS MATERIAL SUBJECT TO ANY LEGAL RESTRICTIONS FOR PUBLICATION OR PRESENTATION THROUGH A COLLABORATIVE RESEARCH AND DEVELOPMENT AGREEMENT (CRADA), MATERIAL TRANSFER AGREEMENT (MTA), INTELLECTUAL PROPERTY RIGHTS AGREEMENT ETC.? ☐ YES ☒ NO NOTE: If the answer is YES then attach a copy of the Agreement to the Publications/Presentations Request Form.

11. MATERIAL IS FOR: ☐ DOMESTIC RELEASE ☒ FOREIGN RELEASE

CHECK APPROPRIATE BOX OR BOXES FOR APPROVAL WITH THIS REQUEST. ATTACH COPY OF MATERIAL TO BE PUBLISHED/PRESENTED.

☐ 11a. PUBLICATION/JOURNAL (List intended publication/journal.)

☐ 11b. PUBLISHED ABSTRACT (List intended journal.)

☐ 11c. POSTER (To be demonstrated at meeting: name of meeting, city, state, and date of meeting.)

☐ 11d. PLATFORM PRESENTATION (At civilian institutions: name of meeting, state, and date of meeting.)
Association of Surgeons of Great Britain and Ireland/ 11-13 May 2016

☐ 11e. OTHER (Describe: name of meeting, city, state, and date of meeting.)

12. EXPECTED DATE WHEN YOU WILL NEED THE CRD TO SUBMIT YOUR CLEARED PRESENTATION/PUBLICATION TO DTIC
NOTE: All publications/presentations are required to be placed in the Defense Technical Information Center (DTIC).

DATE

May 10, 2016

13. 59 MDW PRIMARY POINT OF CONTACT (Last Name, First Name, M.I., email)

Corpus Raul S, raul.s.corpus.ctr@mail.mil

14. DUTY PHONE/PAGER NUMBER

2105394404

15. AUTHORSHIP AND CO-AUTHOR(S) List in the order they will appear in the manuscript.

LAST NAME, FIRST NAME AND M.I.	GRADE/RANK	SQUADRON/GROUP/OFFICE SYMBOL	INSTITUTION (If not 59 MDW)
a. Primary/Corresponding Author Kevin Wu	CTR	59MDW ST RESTOR	
b. Renford Cindass	O-3	59MDW ST RESTOR	
c. JR Spencer	GS13	59MDW ST RESTOR	
d. Mark Roth			FHCRC
e. Vijay Gorantla			UPitt
f. Michael R Davis	O-5	59MDW ST RESTOR	

I CERTIFY ANY HUMAN OR ANIMAL RESEARCH RELATED STUDIES WERE APPROVED AND PERFORMED IN STRICT ACCORDANCE WITH 32 CFR 219, AFMAN 40-401_IP, AND 59 MDW 41-108. I HAVE READ THE FINAL VERSION OF THE ATTACHED MATERIAL AND CERTIFY THAT IT IS AN ACCURATE MANUSCRIPT FOR PUBLICATION AND/OR PRESENTATION.

16. AUTHOR'S PRINTED NAME, RANK, GRADE

Kevin Wu, CTR

17. AUTHOR'S SIGNATURE

Kevin Wu

18. DATE

April 26, 2016

19. APPROVING AUTHORITY'S PRINTED NAME, RANK, TITLE

Michael R Davis, Lt Col, Director-RESTOR, Deputy Commander

20. APPROVING AUTHORITY'S SIGNATURE

Michael R Davis

21. DATE

April 26, 2016

PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS			
1st ENDORSEMENT (59 MDW/SGVU Use Only)			
TO: Clinical Research Division 59 MDW/CRD Contact 292-7141 for email instructions.	22. DATE RECEIVED 4/26/2016	23. ASSIGNED PROCESSING REQUEST FILE NUMBER 16192	
24. DATE REVIEWED 29 Apr 2016		25. DATE FORWARDED TO 502 ISG/JAC	
26. AUTHOR CONTACTED FOR RECOMMENDED OR NECESSARY CHANGES: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES If yes, give date. <input type="checkbox"/> N/A			
27. COMMENTS <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> DISAPPROVED <div style="margin-top: 10px;">The presentation is approved.</div>			
28. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Rocky Calcote, PhD, Clinical Res. Administrator		29. REVIEWER SIGNATURE CALCOTE.ROCKY.D.117824 5844 <small>Digitally signed by CALCOTE.ROCKY.D.1178245844 DN: cn=US, ou=US Government, ou=DOD, ou=PKI, ou=USAF, c=US, email=calcoterocky@us.af.mil Date: 2016.04.29 06:37:27 -0500</small>	
30. DATE		6 May 2016	
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40. PRINTED NAME, RANK/GRADE, TITLE OF REVIEWER Christopher Carwile, TSgt/E-6, NCOIC, PA		41. REVIEWER SIGNATURE CARWILE.CHRISTOPHER. STEWART.1280477229 <small>Digitally signed by CARWILE.CHRISTOPHER.STEWART.1280477229 DN: cn=US, ou=US Government, ou=DOD, ou=PKI, ou=USAF, cn=CARWILE.CHRISTOPHER.STEWART.1280477229 Date: 2016.05.06 10:59:52 -0500</small>	
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Ex-vivo Graft Preservation with Hydrogen Sulfide and Hydrogen Iodide for
Suspended Animation of Non-Human Primate (*Macaca mulatta*) Upper Extremity
Vascularized Composite Allotransplants

**Kevin Wu, Renford Cindass, Shari Lawson, Jerry R Spencer, Mark
Roth,**

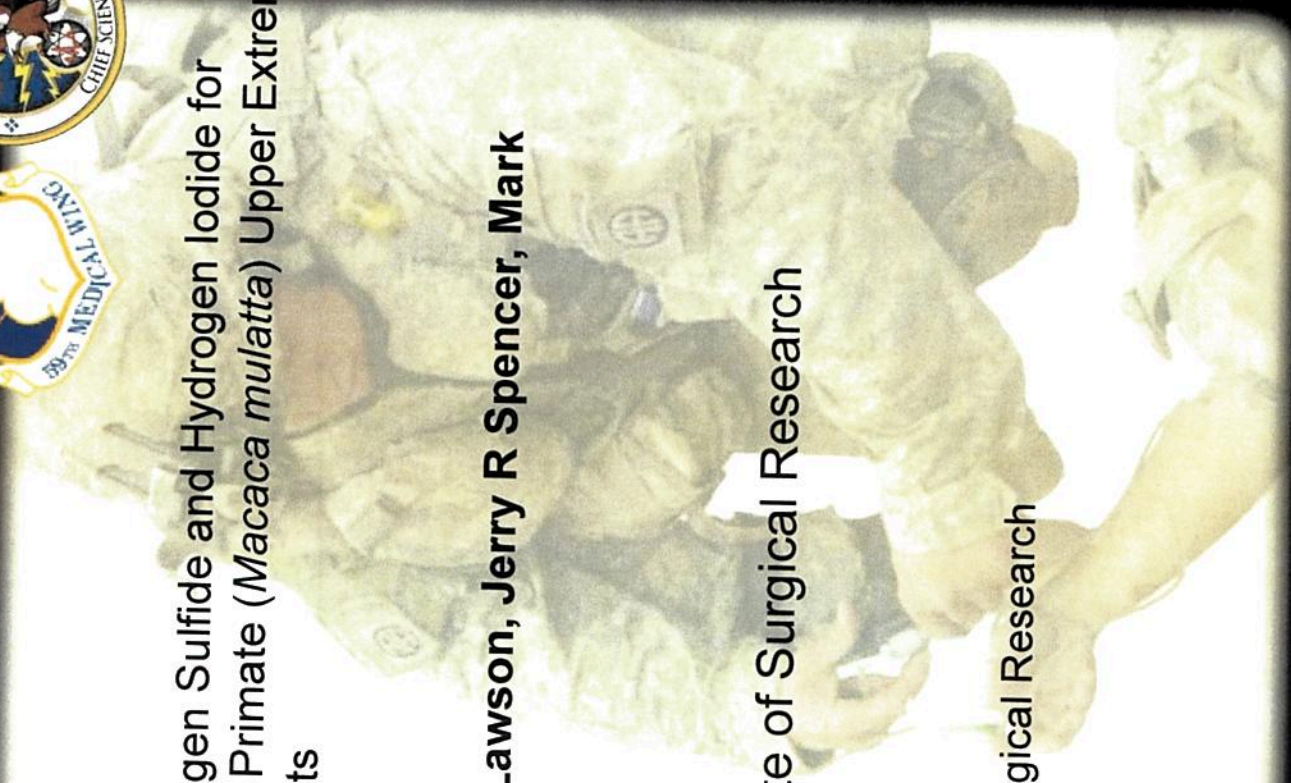
V S Gorantla, Michael R Davis

Kevin Y. Wu, MD

Research Fellow, US Army Institute of Surgical Research

**Lt Col Michael R. Davis, MD, FACS
RESTOR Program**

**Deputy Commander, USA Institute of Surgical Research
59MDW Science and Technology Office
San Antonio, TX, USA**





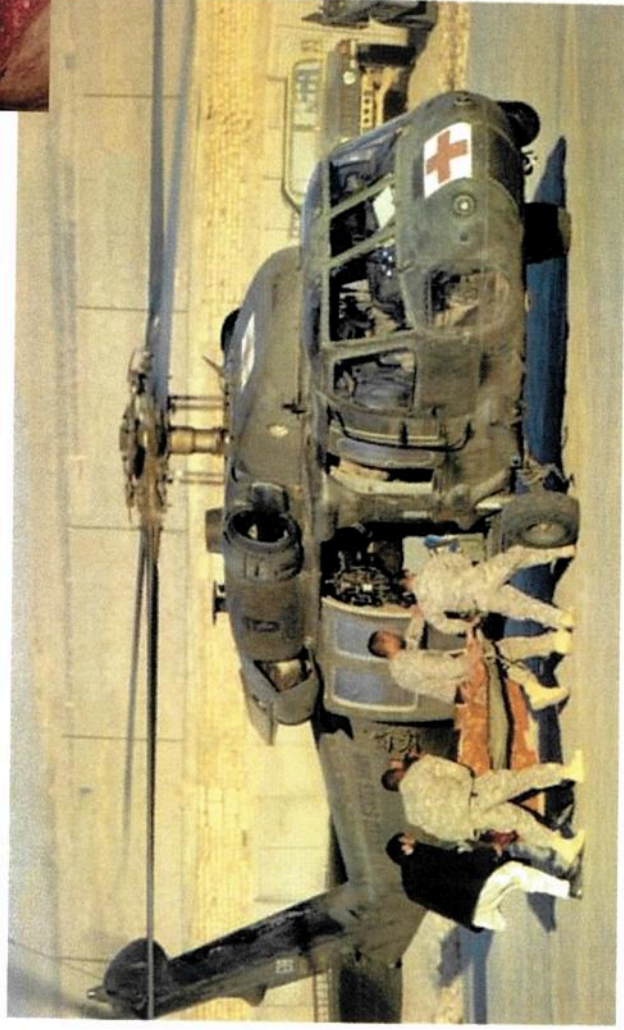
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The views expressed are those of the authors and do not reflect the official view or policy of the Department of Defense, Department of the Army, Department of the Air Force or its Components.

The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended



Background

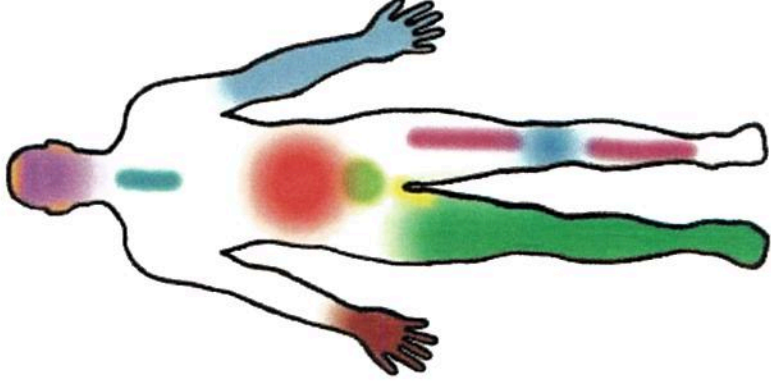


Surviving soldiers from battlefield injuries are presenting with more complex wound patterns in the extremities and face.





Vascularized composite allotransplantation (VCA)



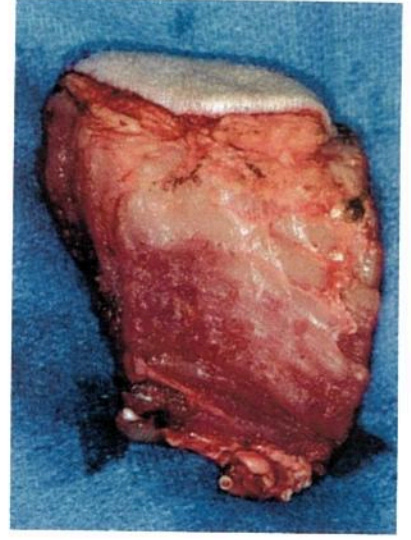
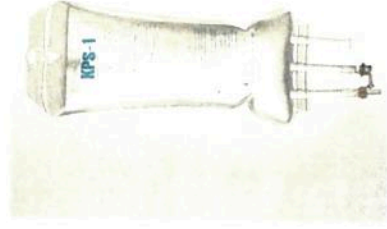


This anatomical illustration shows a dissection of the hand and forearm, focusing on the vascular system. The 'Respirant arm' is shown at the top. The 'Skin flap' is reflected to reveal the underlying 'Muscles'. The 'Veins' are shown running along the 'Arteries'. The 'Nerves' and 'Bone plates' are also visible. The 'Dorsal hand' and 'Palm' are labeled. The illustration is signed 'J. H. 18' in the bottom right corner.

- Requires systemic immunosuppression
- Skin is a primary target for rejection
- Limited donor pool
- Few indications
- Shorter period for ischemia time
- Ischemic reperfusion injury



Current Standard of Care for Organ Transplants





Hydrogen Sulfide (H_2S)



H_2S Induces a Suspended Animation-Like State in Mice

Eric Black Stone, Mike Morrison, Mark B. Roth

Science 22 Apr 2005:

Vol. 308, Issue 5721, pp. 518

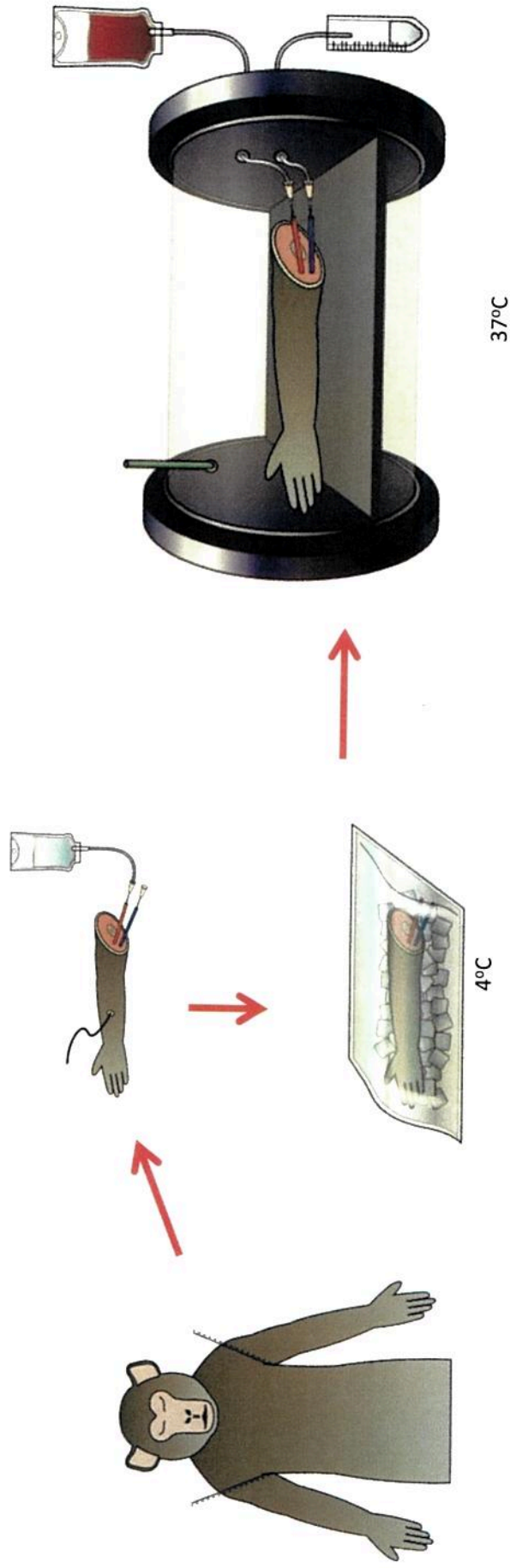
DOI: 10.1126/science.1108581

- Reversibly reduce the metabolic rate of mice exposed to 80 ppm of hydrogen sulfide
- Core temperature reduced as much as 11°
- Animals in this state for 6 hours and they recover completely



Method

1. UW
2. UW and H₂S
3. UW and HI





Conclusions

- H₂S may play a role in mitigating onset of acute rejection in porcine VCA model in the absence of immunosuppression
- Potential use for graft preservation strategies in a clinical setting that may require prolonged ischemic periods

Thank You

